SAIIE29 Proceedings, 24th – 26th of October 2018, Spier, Stellenbosch, South Africa © 2018 SAIIE

A METHODOLOGY TO ASSIST PROJECT-BASED ORGANISATIONS TO UTILISE AND DEVELOP PROJECT MANAGEMENT CAPABILITY AS A STRATEGIC ASSET TO INCREASE COMPETITIVE ADVANTAGE

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ABSTRACT

Project Management, in business, plays both a functional and a strategic role in the sustainability of the organisation. The former, and its role towards the success of the organisation, has been researched intensively. The strategic role of Project Management towards the long-term sustainable success of an organisation is a new research topic with limited existing work done. A need therefore exists in project-based organisations to utilise their Project Management capabilities, not only towards functionally delivering successful projects but to apply it as a strategic asset to increase long-term organisational competitive advantage. The aim of this study, and goal of this paper, is to research the importance of Project Management as a strategic asset and to develop a model which can be used to evaluate the strength of Project Management as a strategic asset. This aim will be reached by conducting an integrated literature study on the knowledge areas of Project-Based Organisations, Project Management Capability- and Maturity Models and Strategic Management.

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1. INTRODUCTION

Project-based organisations can be defined as organisations with organisational structures designed around projects, and the delivery of projects on an on-going basis [1]. The business processes of project-based organisations are designed and structured around projects and the support of projects on an ongoing basis. Projects within these types of organisations are mostly long in duration, high capital value and complex. Furthermore, these organisations are cross-functional and generate income through designing, constructing and selling projects and services that are not of a standardised nature. In other words, the products and services offered by these organizations are unique to the client's requirements and budget.

Project Management in non-project-based organisations are in place to support the organisation's improvement strategy and to support its core value chain [2]. It can thus be said that *Project Management* in these organisations are put in place either to design and improve the existing business offering or to design and improve processes in which the existing product or serves are produced and offered to the client. On the other hand, in project-based organisations, Project Management forms part of the core business processes. For these organisations, the long-term sustainable success of these businesses relies on the organisation's *Project Management Capability*. As a result, it is important to understand the strategic importance of *Project Management* in these organisations, as well as to be able to understand how to measure the strategic strength, or aligned, as well as how competitive the organisation's project management capability is within these organisations. A need, therefore, exists for a method, framework or model to measure these aspects, and in the process supply a solution for these organisations to improve.

2. DESIGN REQUIREMENTS AND SUB-MODELS

The research took a *reverse design* approach whereby the research problem statement was taken as a point of departure, and through a combination of *systems engineering* and *iterative design*, developed the detail for a proposed model which could solve the above mentioned problem. The research problem is defined as follow:

> *"Project-based Organisations have the need to assess the alignment of their Project Management Capability as a strategic business asset, in order to ensure sustainable competitive advantage within the industry."*

By applying the *reverse design* approach and through the processes of *systems engineering problem solving* the research problem statement were further developed into nine model design requirements, which were then sub-developed into Output Requirements (OR), Input Requirements (IR) and Process Requirements (PR). These nine sets design requirements, shown in the knowledge areas they reside in, are shown in Table 1 below.

Table 1: Model Design Requirements

	DESIGN REQUIREMENTS
I.	PROJECT BASED ORGANISATION
OR1	The model should be able to produce a quantitative score, or status, on whether, and how strongly the organisation can be categorised as a PBO.
PR1	The model should be able to assess to what extent the organisation can be categorised as a project-based organisation.
IR1	The model should be able to accept information which can be utilised to do an assessment of the organisation's PBO status.
II.	PROJECT MANAGEMENT MATURITY
OR2	The model should be able to produce a quantitative score, or status, on the maturity level of the organisation's PMC.
PR2	The model should be able to assess the organisation's PMM.
IR2	The model should be able to accept information which can be utilised to assess the organisation's PMM.

OR3	The model should be able to produce specific information on how the organisation's PMM can be improved.
PR3	The model should be able to calculate or highlight areas of improvement to improve the PMM level.
IR3	The model should be able to accept information which can be utilised to highlight areas of improvement to improve the level of PMM.
III.	STRATEGIC ASSET
OR4	The model should be able to produce a quantitative score, or status, on how closely the organisation's PMC is aligned towards being a strategic asset.
PR4	The model should be able to assess the organisation's PMC towards being a strategic asset.
IR4	The model should be able to accept information which can be utilised to assess the organisation's PMC towards being a strategic asset.
OR5	The model should be able to produce specific information on how the organisation's PMC can be improved to be more aligned towards being a strategic asset for the organisation.
PR5	The model should be able to calculate or highlight areas of improvement within the PMC to improve the alignment towards being a strategic asset for the organisation.
IR5	The model should be able to accept information which can be utilised to improve the alignment towards being a strategic asset for the organisation.
IV.	SUSTAINABLE COMPETITIVE ADVANTAGE
OR6	The model should be able to produce a quantitative score, or status, of how competitive the organisation's PMC is within the industry it operates in.
PR6	The model should be able to assess how competitive the organisation's PMC is within the industry it operates in.
IR6	The model should be able to accept information which can be utilised to assess how competitive the organisation's PMC is within the industry it operates in.
OR7	The model should be able to produce specific information on how the organisation's PMC can be improved to be more competitive in the industry it operates in.
PR7	The model should be able to calculate or highlight areas of improvement to improve the competitiveness of its PMC within the industry it operates in.
IR7	The model should be able to accept information which can be utilised to improve the competitive advantage of its PMC.
OR8	The model should be able to produce a quantitative score, or status, on how sustainable its PMC competitiveness is within the industry it operates in.
PR8	The model should be able to assess how sustainable its PMC competitiveness is within the industry it operates in.
IR8	The model should be able to accept information which can be utilised to how sustainable its PMC competitiveness is within the industry it operates in.
OR9	The model should be able to produce specific information on how to improve the sustainability of the organisation's PMC competitive advantage.
PR9	The model should be able to calculate or highlight areas of improvement to improve the competitive advantage sustainability of its PMC.
IR9	The model should be able to accept information which can be utilised to improve the competitive advantage sustainability of its PMC.

The framework for the required model was then developed by proposing five *sub-models*, each addressing a set of design requirements as mentioned above and listed below.

- Sub-Model 1 – Project Based Assessment
- Sub-Model 2 – Project Management Maturity Assessment
- Sub-Model 3 – Strategic Asset Alignment Assessment
- Sub-Model 4 – Competitive Advantage Assessment
- Sub-Model 5 – Competitive Advantage Sustainability Assessment

The detail for the five *sub-models* was developed by applying in-depth literature studies on the knowledge areas presented by the *sub-models* and *design requirements* listed above. From the main study, the knowledge areas

are *Project Management & Project-Based Organisations*; *Project Management Capability & Maturity*; and *Strategic Management, Strategic Assets & Competitive Advantage*.

2.1 Project Management & Project-based Organisations

The first set of design requirements focuses on defining and categorising Project-based Organisations (OR1, PR1, IR1). Traditionally the aim of *Project Management*, within organisations, was to support and execute projects successfully. This fact is changing as the result of the high demand on organisations to be more efficient and more competitive [3]. Bollinger and Smith [3] further state that organisations can no longer rely on traditional ways of Project Management, but should position themselves in a way that *Project Management* takes on a more strategic role in the organisation to assure sustainable success. This approach is even more imperative in organisations in which Project Management plays a strategic role towards the success of the organisation, i.e. *Project-based Organisations*. *Project-based Organisations* can be defined as organisations with organisational structures designed around projects, and the delivery of projects on an on-going basis [1]. By applying the studies of Archibald and Peppard [4], Kerzner [5] and Morris [2], the criteria for *Project-Based Organisations* were identified. These criteria were further developed into *Project-Based Organisations Assessment Statements*, which is listed below.

1. Your organisation's primary business is made up of delivering successful projects in an ongoing and sustainable manner.
2. Your organisation's growth strategies are positioned around the size, type, location and nature of the projects it takes on.
3. When comparing resource allocation between projects and operations, most of your organisation's resources are allocated towards the execution of successful projects, on an ongoing basis.
4. Project management is part of your organisation's core business processes.
5. In the development of your organisation's project, the following generic sequence is followed rigidly: *idea, outline, concept and strategy, and close-out*.
6. Your organisation has a value chain set up and designed to support the construction and selling of non-standardise products, goods and services.

These six *Project-Based Organisations Assessment Statements* were then applied into *sub-model 1*, to assess whether the organisation can be categorised as a *Project Based Organisations* and how strong it can be categorised as a *Project Based Organisations*. *[6] [7] [8] [9] [10] [11] [12] [13] [14] 15] [16]

2.2 Project Management Capability and Maturity Levels

The second set of design requirements has to do with measuring the organisation's *Project Management Capability*, and how it can be improved (OR2, PR2, IR2, OR3, PR3, IR3). It can be said that *Organisational Capability* is the organisation's ability to function as it should, or to do what it is there to do. Kelchner [17] take this further by stating that organisational capability is the organisation's ability to manage its resources effectively and to utilise this to gain a further *competitive advantage* in the industry. Scott [18] supports this theory by stating that *Business Capabilities* describe the organisation's unique and collective ability which must be applied to reach a specific desirable outcome. Peppard and Ward [19] state that organisational capability refers to how the organisation is applying their competencies, or capabilities, strategically. Therefore, if it can be said that the organisation is categorised as a *Project-based Organisation*, its strategic capabilities should be focused around the function of *Project Management*. A way to measure the state, or maturity, of the organisation's *Project Management Capability*, is through describing and quantifying the organisation through its *Project Management Maturity*.

To solve the bigger research problem and to link to what was said above, a need therefore exists for a way to measure the organisation's *Project Management Capability*, i.e. *Project Management Maturity*. To accomplish this, a critical analysis on existing *Project Management Maturity Models* were done. From this analysis the following criteria were developed which are to be taken into account when choosing, or developing, a *Project Management Maturity Model* for the proposed model:

- It should be fully customisable, from one organisation to another;
- It should be able to align *Project Management Capabilities* with organisational strategic objectives;

- It should be able to measure predefined *Key Performance Indicators*, aligned with the Project Management knowledge areas;
- It should be able to measure *Project Management Capabilities* in the context of the Project Management domains, i.e. *Projects, Programs* and *Portfolios*;
- It should be able to incorporate the iterative improvement framework of *plan-do-check-act*;
- It should be an evidence-based model;
- It should be simple and easy to use;
- It should supply output in a single value of assessment plus highlight areas of improvement towards next assessment; and
- It should be able to form part of a bigger assessment model.

After an assessment of existing *Project Management Maturity Models* in the context of the criteria mentioned above, it was found that none of the existing models satisfy these criteria. The criteria were then applied to *Project-Management-Maturity-Model* theory to come up with a new *Project Management Maturity Model*. This new model was applied to form *sub-model 2, as mentioned above,* of the proposed model. *[20] [21] [22] [23] [24] [25] [26] [27] [28] [29] [30]

2.3 Strategic Management, Strategic Assets and Competitive Advantage.

The third set of design requirements (OR4, PR4, IR4, OR5, PR5, IR5) has to do with how strongly the organisation's *Project Management Capability* is aligned into being a strategic asset for the organisation, and how this *strategic asset alignment* can be improved. Amit and Schoemaker [31] states that a *strategic asset* is an organisational asset which are, *scarce*, *hard to trade*, *hard to imitate* and which can add *value to the strategic goals* of the organisation. Bollinger and Smith [32] take this further by stating that these types of assets are a key factor in the sustainable success and competitive advantage of any organisation. By taking the above mentioned criteria, [31], into account, and by applying it to the *Project Management Capabilities*, identified in *Project Management Maturity Model*, a *Strategic Asset Alignment* assessment is proposed, *sub-model 3*.

The fourth set of design requirements (OR6, PR6, IR6, OR7, PR7, IR7, OR8, PR8, IR8, OR9, PR9, IR9) has to do with how competitive the organisation is, as a result of its *Project Management Capability* in the industry it operates in. In this regard, Chakraborty [10] said that an organisation can gain competitive advantage through various ways, which might include some of the following: The organisation's activities (to add value, see below for Porter's perspective on Competitive Advantage); Organisational culture; Processes; Structure; and Innovation. *Strategic Positioning*, on the other hand, is defined by Porter [33] as the process in which organisations attempts to achieve a *sustainable competitive advantage*. This *Strategic Positioning* is achieved through keeping to itself the distinctive activities adding value to the organisation and putting them apart from other industry role players. In other words, it means to perform different activities, or performing similar activities in different ways than competitive industry role players. It is therefore not only important to achieve high levels competitiveness in the industry you operate in, but also to have systems and processes in place to assure *sustainability* in that competitiveness. Porter [33] therefore states that for the organisation to be categorised as competitive in its industry, it needs to either perform different activities than industry competitors, or perform similar activities different than industry competitors. This notion was then applied to the proposed model, to form *sub-model 4*, in which an assessment is proposed whereby Porter's requirement for competitiveness is applied to the *Project Management Capabilities* identified earlier.

In his study, Porter [33] further mentions that a direct correlation exists between the organisation's ability to apply innovation and how sustainable it is in its competitiveness. Because one of the *Key Performance Indexes,* identified as part of the *Project Management Maturity Model* (sub-model 2), under which the *Project Management Capabilities* are categorised in, is innovation, it was proposed that this score be applied to the model as *sub-model 5*. This scoring is done to give an indication, or probability, of how sustainable the organisation's sustainable competitiveness is. *[34] [35] [36] [37] [38] [39] [40] [41] [42] [43] [44] [45]

Figure 1 shows visually what was described above, in the context of the proposed model framework.

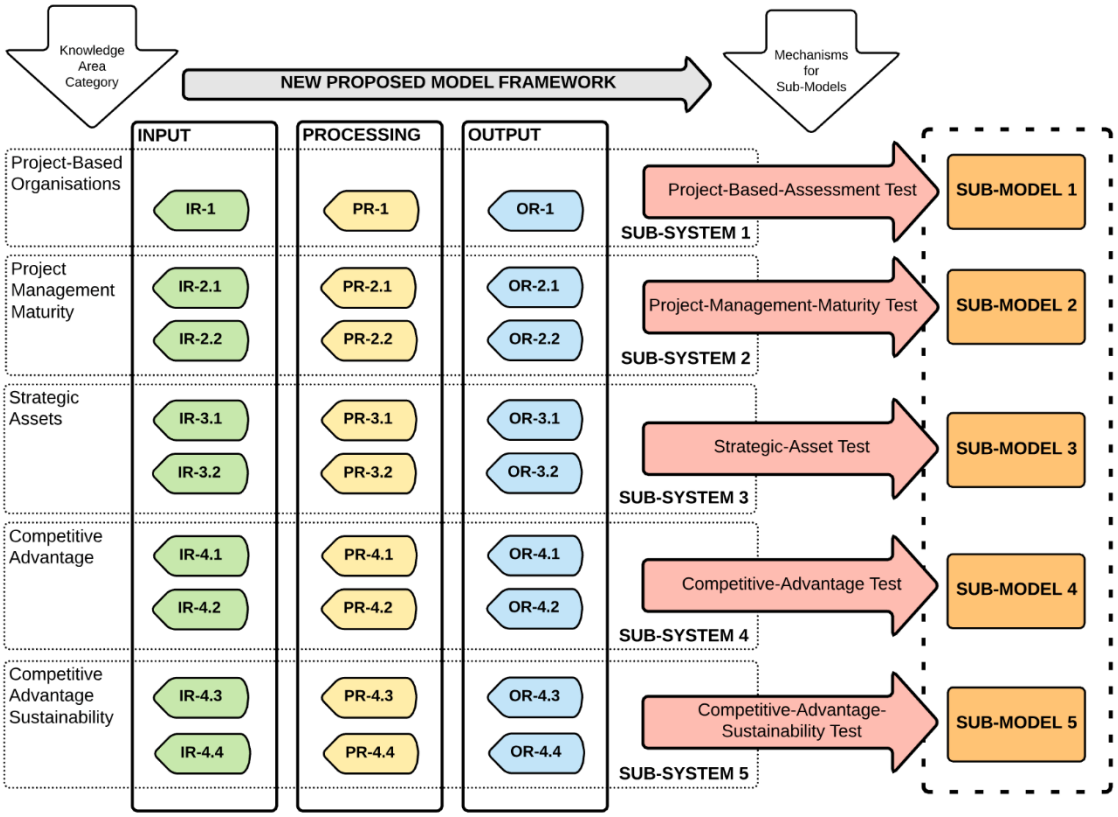

Figure 1: Proposed Model Framework

3. INITIAL MODEL DESIGN

Knowing the detail of how the design requirements will be met, through the various *sub-models* one to five, and by applying the framework, shown in Figure 1, the detail of the model was designed by taking on a break-down approach, shown in Figure 2.

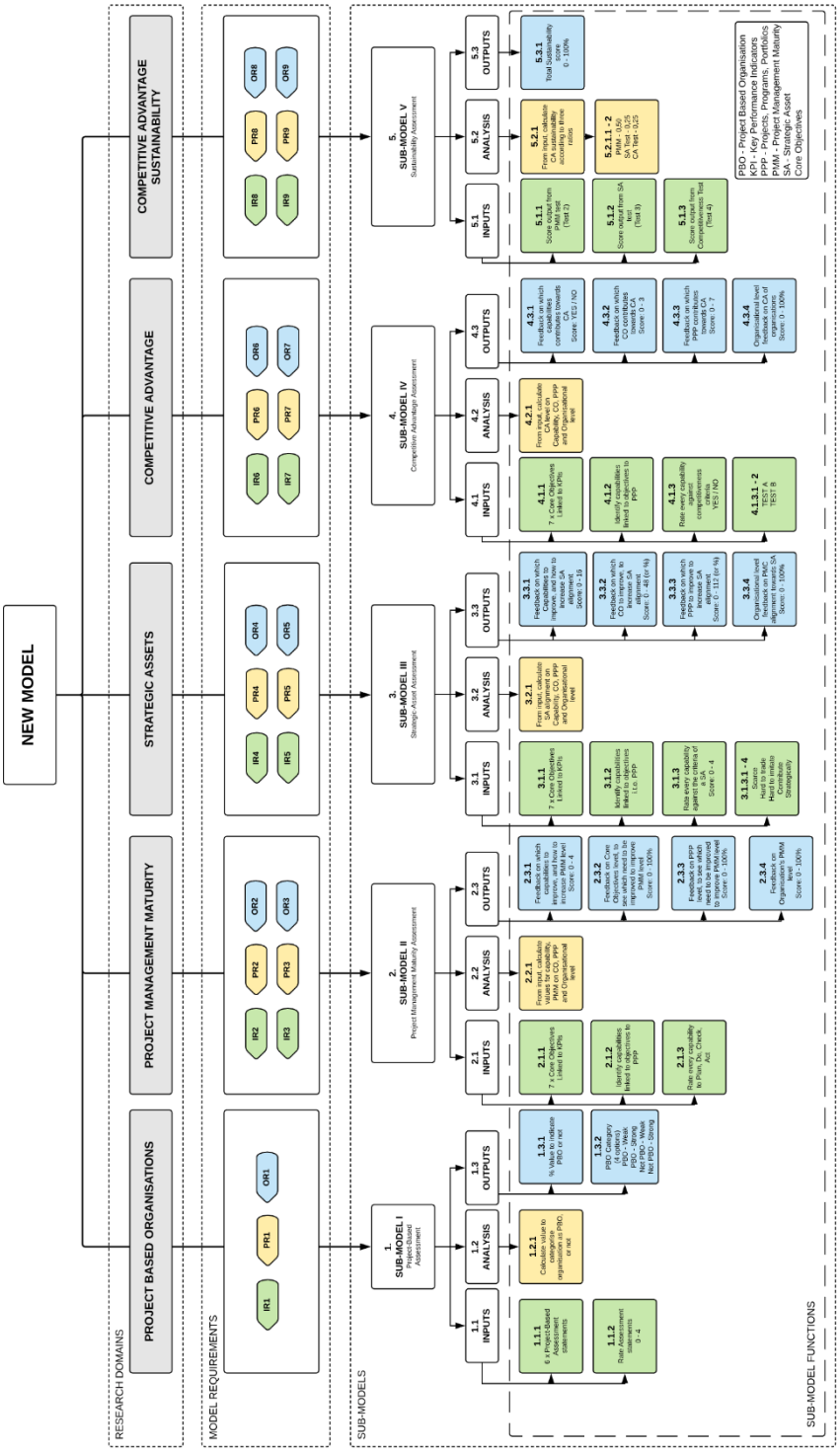

Figure 2: New Model Component Layout

The underlining detail of the subcomponents mentioned above were then sequenced into a work flow which forms the inner working of the proposed initial model (Rev_00). See Figure 3.

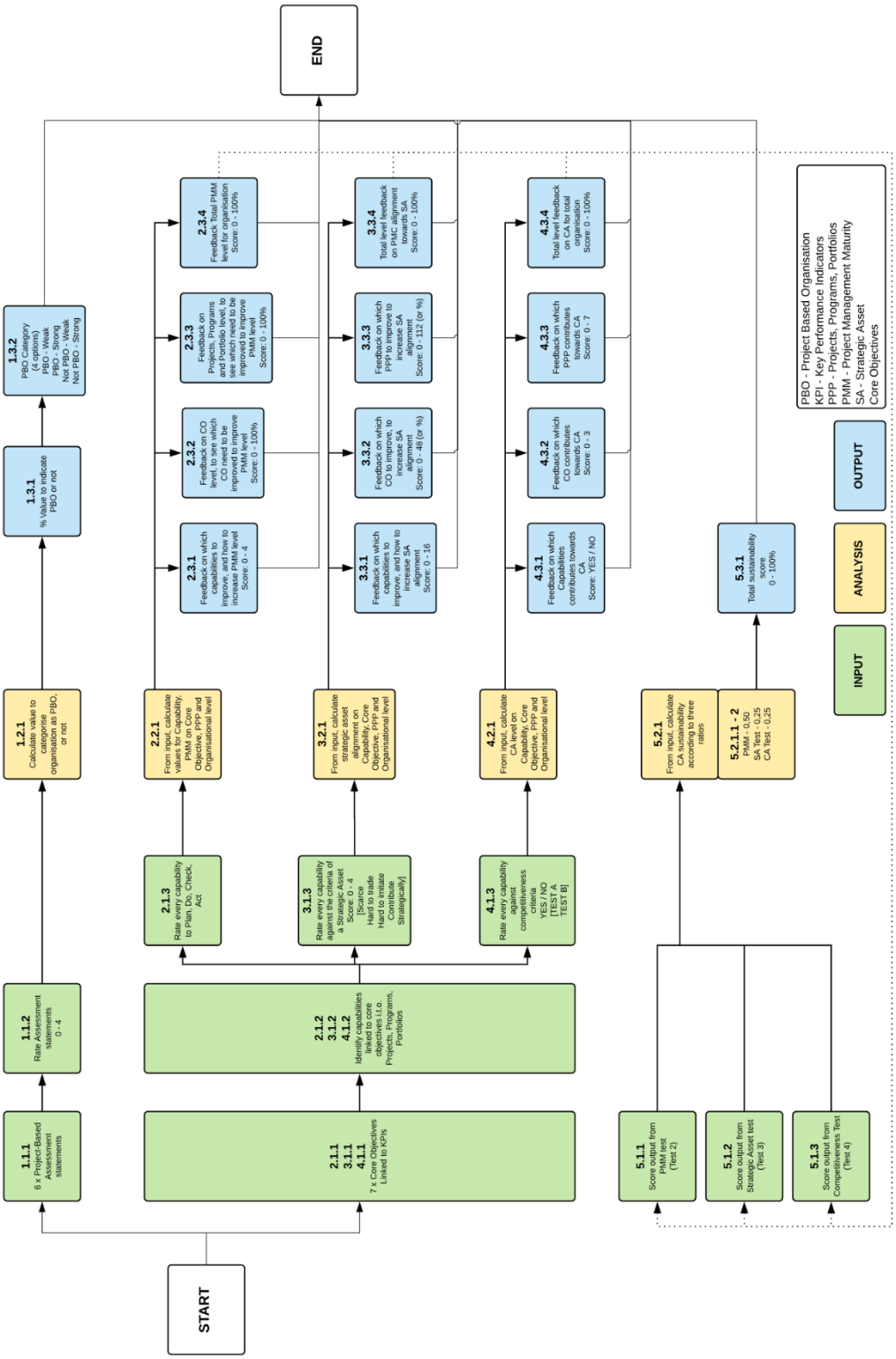

Figure 3: New Model Workflow

From what is shown above, it can be seen that for the model to function, the following input values are required:

1. Rate the organisation according to the *Project Based Assessment Statements*.
2. Identify seven core objectives linked to the *Key Performance Indexes* and *Project Management Knowledge Areas*, as part of the *Project Management Maturity Model*.
3. Identify the *Project Management Capabilities*, linked to each core objective in the context of the Project Management domains, i.e. *Projects, Programs* and *Portfolios*.
4. Rate every *Project Management Capability* in terms of the framework of *Plan, Do, Check, Act*, as part of the *Management Maturity Model*.
5. Rate every *Project Management Capability* against the criteria of being a strategic asset, i.e. *scarce, hard to trade, hard to imitate and adding value strategically*.
6. Rate every *Project Management Capability* against the criteria of sustainable competitive advantage, i.e. *perform different activities, or performing similar activities in different ways than industry competitors*.

By applying these inputs to the proposed model, the following outputs are generated:

1. ***Project Based Organisation Score*** - Quantitative value on how strong the organisation can be categorised as a *Project Based Organisation*. (0 – 100%).
2. ***Project Management Maturity Score*** - Organisation wide-, Domain Level-, Core Objectives-, and Capability Level- quantitative feedback on the *Project Management Maturity* level. (0 – 100%)
3. ***Strategic Asset Alignment Score*** - Organisation wide-, Domain Level-, Core Objectives-, and Capability Level- quantitative feedback on the Strategic Asset Alignment. (0 – 100%)
4. ***Competitive Advantage Score*** - Organisation wide-, Domain Level-, Core Objectives-, and Capability Level- quantitative feedback on how competitive the organisation is in the industry it operates in. (0 – 100%)
5. ***Competitive Advantage Sustainability Score*** - Organisation wide quantitative feedback on the *Sustainability* of the *Competitive Advantage*. (0 – 100%)

4. INITIAL MODEL VERIFICATION

After the initial design of the proposed model, the model was shown and explained to academic experts. The reason for this is twofold: firstly to gain constructive and informed feedback on the construction, usability and academic integrity of the model, and secondly to identify areas of improvement.

For this task five academic experts were chosen based on the following criteria: They have to be established academic professionals, who are able to add value by supplying constructive feedback in the knowledge areas of *Project Management* and *Strategic Management* and should also have prior knowledge and (or) experience in leading research or doing research themselves with regards to *new model-* or *framework development* in the academic environment. The interviews were held as semi structured interviews. The credentials of the academic experts taking part in this study is shown in Table 2.

Table 2: Academic Experts Credentials

	Academic Expert	Credentials
1.	**Dr. John Morrison**	PhD, Engineering, Project Management
2.	**Prof Herman Steyn**	PhD and Professor in Project Management
3.	**Dr Dirk Le Roux**	PhD Project Management, Information Technologies, IT strategy development, Project Portfolio Management, Programme Management
4.	**Dr Gerhard Ungerer**	PhD Industrial Engineering, Digital Enterprise Strategy, Digital Enterprise Strategist, Management Consultant
5.	**Prof Carl Marnewick**	PhD and Professor in Project Management

From the interview outputs, is was clear that a need for such a model does indeed exists as well as the fact that the model was based and developed on sound academic principles. From the interviews, the following updates to the model were proposed:

- **Proposed update 1**: As part of the output of the model, supply a high level (aggregated) feedback, giving a total combined model score for the assessment done.
- **Proposed update 2**: Give maturity feedback in terms of a five point scale, in line with other Project Management methodologies and maturity models.
- **Proposed update 3**: On the first iteration of the model, the total values were equally divided into the outputs of the three *Project Management Domains*, (Projects, Programs and Portfolios). As a result of organisational priorities and developments differences, it was proposed that the organisation under assessment gets to weight the relative importance of the domains to normalise feedback given. It was therefore decided to give output of the model in two sets, unweighted feedback (for external benchmarking) and weighted feedback (for internal benchmarking).
- **Proposed update 4**: It was further proposed that summary level feedback is also given summarising the output for the model in graphs, highlighting the areas of improvements.

These updates were then incorporated into the second iteration of the proposed model (model Rev_01).

5. CASE STUDY VALIDATION

One of the biggest advantages of applying case study validation it that a variety of sources can be applied to test a new framework or methodology. With the new model now develop, it is proposed that the model be tested by means of a case study validation process. Thomas [46] defines a *case study* follow:

> *"Case study is an in-depth exploration from multiple perspectives of the complexity and uniqueness of a particular project, policy, institution, program or system in a "real life" context."*

In the same paper, George and Bennet [47] notes that six types of case studies exist. Each with its own purpose within the research process.

- *Atheoretical / configurative idiographic*: Case studies supporting studies or research not contributing to theory;
- *Disciplined configurative*: Case studies applying theories to explain the case or phenomenon;
- *Heuristic*: Case studies applied to identify new causal paths;
- *Theory testing*: Case studies being applied to test the validity and scope conditions of single or competing theories;
- *Plausibility probes*: Case studies being applied to do preliminary studies in the process of determining whether further studies are warranted; and
- *Building block*: Case studies being applied to identify common patterns or investigate whether a new model or framework is fulfilling its purpose.

After the second iteration of the model was finalised, the model was validated by testing it on real life organisations. The purpose of the validation was therefore to test whether the new proposed model is satisfying its purpose, *building block case study* validation was therefore applied for this purpose. For the validation process, four companies were chosen to take part on the basis of the following criteria:

- The companies had to be local and accessible to conduct both the assessment and the questionnaire after the assessment;
- The companies had to be small to medium size organisation, with the researcher having direct access to management and/or someone with insight into strategic management process or the company;
- The companies had to operate in the project environment;
- The companies had to be from various industries; and
- The companies had to be established, in both business and product offering, in the industries they operate in.

By applying these criteria, four companies were identified, as shown in Table 3 below.

Table 3: Case Study Organisation Details

	COMPANY	CONTACT PERSON	ROLE	INDUSTRY	TURNOVER /YEAR	BASED
1.	Company November	Mr. CB	Project Director	Industrial Manufacture, Marine	R 600 Million	Cape Town
2.	Company Whiskey	Mr. WVN	Owner & Managing Director	Construction	R 25 Million	George
3.	Company Mike	Mr. JVW	Owner & CEO	Industrial Manufacture	R 120 Million	Cape Town
4.	Company Betha	Mr. FD	CEO	Control Systems, Mining	R 100 Million	Stellenbosch

The model was applied to the four companies mentioned above, after which the output of the assessments was discussed with the organisations. Due to the length limitations to this paper, only the organisational level output of the model (as applied to the four companies) is shown in Table 4 below.

Table 4: Organisational Level Model Feedback

	COMPANY	WEIGHTED / UN-WEIGHTED SCORE (PPP)	MATURITY INDICATOR	STRATEGIC ASSET ALIGNMENT	COMPETITIVE ADVANTAGE INDICATOR	COMPETITIVE ADVANTAGE SUSTAINABILITY INDICATOR
1.	November-Co	Un-weighted	29% - LEVEL 2	69%	81%	36%
		Weighted	33% - LEVEL 2	67%	77%	31%
2.	Whiskey-Co	Un-weighted	37% - LEVEL 2	63%	71%	70%
		Weighted	41% - LEVEL 2	65%	71%	73%
3.	Mike-Co	Un-weighted	31% - LEVEL 2	69%	76%	48%
		Weighted	36% - LEVEL 2	63%	71%	55%
4.	Betha-Co	Un-weighted	19% - LEVEL 1	52%	38%	26%
		Weighted	21% - LEVEL 2	52%	32%	21%

These results, as well as the detail from which it is made up from, were shared with the key contact persons in the various organisations who took part in the validation case studies. It was said earlier in this paper that the need for a model exists which can assist project-based organisations to assess the alignment of their Project Management Capability as a strategic asset, in order to ensure sustainable competitive advantage. From applying the proposed model to the cases mentioned above, and gaining the listed output, it can therefore be said that the new proposed model is validated, i.e. the model is functioning as it is intended to.

After the assessments were completed, the interviewees were asked to take part in a further verification questionnaire in which the design requirements were tested against the model outputs. Nine verification questions were developed and asked, to test the 27 design requirements. The detail of which is shown in Table 5 below.

Table 5: External Verification Questionnaires

DESIGN REQUIREMENT		VERIFICATION QUESTION	
Project Based Organisation			
1	OR1	VQ-A1	The model is able to guide you through the process of providing relevant data to do an assessment and give relevant output as to what extent your organisation can be categorised as a PBO.
2	PR1		
3	IR1		
Project Management Maturity			
4	OR2	VQ-B1	The model is able to guide you through the process of providing relevant data to do an assessment and give relevant quantitative output, or feedback, on the maturity of your organisation's PMC.
5	PR2		
6	IR2		
7	OR3	VQ-B2	The model is able to guide you through the process of providing relevant data to do an assessment and give relevant quantitative output, or feedback, on how the organisation's PMM can be improved by referring to the improvement of specific Project Management Capabilities.
8	PR3		
9	IR3		
Strategic Assets			
10	OR4	VQ-C1	The model is able to guide you through the process of providing relevant data to do an assessment and give relevant quantitative output, or feedback, on closely the organisation's PMC is aligned towards being a strategic asset.
11	PR4		
12	IR4		
13	OR5	VQ-C2	The model is able to guide you through the process of providing relevant data to do an assessment and give relevant quantitative output, or feedback, on how to improve the organisation's PMC towards being more aligned towards being a strategic asset for your organisation.
14	PR5		
15	IR5		
Sustainable Competitive Advantage			
16	OR6	VQ-D1	The model is able to guide you through the process of providing relevant data to do an assessment and give relevant quantitative output, or feedback, on how competitive the organisation's PMC is within the industry you are operating in.
17	PR6		
18	IR6		
19	OR7	VQ-D2	The model is able to guide you through the process of providing relevant data to do an assessment and give relevant quantitative output, or feedback, on how organisations can improve its PMC to be more competitive in the industry it operates in.
20	PR7		
21	IR7		
22	OR8	VQ-D3	The model is able to guide you through the process of providing relevant data to do an assessment and give relevant quantitative output, or feedback, on how sustainable the PMC competitiveness is within the industry you are operating in.
23	PR8		
24	IR8		
25	OR9	VQ-D4	The model is able to guide you through the process of providing relevant data to do an assessment and give relevant quantitative output, or feedback, on how to improve the sustainability of the PMC competitiveness within the industry you are operating in.
26	PR9		
27	IR9		

The results from the external verification questionnaires (Table 6) show conclusively that the all the design requirements are met and that the model can be classified as externally verified.

Table 6: Verification Questionnaire Results

		Validators Responses					
	Validation Questions	Mr. CB (November)	Mr. WV (Whiskey)	Mr. JVW (Mike)	Mr. PB (Betha)	Average (%)	Result (Rank)
1.	VQ-A1	4	4	4	3	94%	1
2.	VQ-B1	3	3	3	4	81%	4
3.	VQ-B2	4	4	4	2	88%	3
4.	VQ-C1	3	4	4	3	88%	3
5.	VQ-C2	4	4	4	3	94%	2
6.	VQ-D1	4	3	4	3	88%	3
7.	VQ-D2	3	4	4	2	81%	4
8.	VQ-D3	4	4	3	3	88%	3
9.	VQ-D4	3	4	4	2	81%	4
	Average:	83%	80%	78%	90%	87%	

5.1 Further observations after testing the final model

The following observations were made after the case study tests were concluded:

1. It was observed that when it came to applying the Capability Competitive Ranking (model input), the more specialised industries found it hard to rank the capabilities against other industry role players. It is therefore proposed that if this data cannot be easily generated by the organisation under assessment, that the consultant do a further study into the industry competitors to supply information regarding the industry competitors.

2. In the process of scoring capabilities for the *Project Management Maturity* assessment, it was observed that the model takes in consideration capacities not yet in use (in other words to "aspire to") as well as what will the actions be to improve that capability until the next round of assessment. Currently, the model output only shows maturity level 1 – 4, which means that if a capability is score 0 on in the maturity continuum, that capability will show a maturity of Level 1 (and not 0), which can confuse the interpretation of that. The fact that the maturity level, or maturity score, is also given in terms of a percentage value, should solve a larger part of this problem.

3. In the process of gathering data for the input of the model, it was seen that because most of the organisations used in these case studies were relatively low developed in its *Project Management Capability*, there were no defined or structured *Program* or *Portfolio* functions in these organisations. This lead assessment challenges in terms of gaining data about the organisation's *programs* and *portfolios*. The solution to this challenge is directed at the quality of the facilitation process. It was seen that a good deal of time have to be spent on defining what "programs" and "portfolios" mean for these organisations. One way to get around this challenge is to score the weighting of these two functions lower (or in some cases even zero), therefore the "un-calculated" data given for these scores will not have such a large influence on the output data.

4. One of the high-level requirements of the model was that it had to be flexible and should be able to be adapted to the organisation under assessment. The organisations assessed for these case studies were very diverse, both in its industry, size and level of overall development. The model took that into

consideration and supplied good output as to adding value specifically to the organisation under consideration.

6. CONCLUSION

This paper explored the research proposition that a framework can be developed and that a model can be designed according to this framework, to evaluate the contribution, strength or alignment of organisation's *Project Management Capability* as a *strategic asset*, and to use this information to assure *sustainable competitive advantage* for the organisation.

By applying a needs analysis to the research problems statement, a set of 27 design requirements were developed which were scrutinised by means of a rigorous literature study to form five *sub-models*, each addressing a set of design requirements. The five *sub-models* were then entered into a proposed framework for the model to form the first iteration of the proposed model.

As a means verification, five academic experts were asked to take part in the study by giving insights into the academic integrity of the study as well as to propose updates which will form part of the final iteration of the proposed model. With model being verified and updated according to the academic experts, the final iteration, Rev_01, were developed and validated externally by applying it to four organisations as real-life case studies. The four case study assessments also served as an external verification to assess if all design requirements were met.

From the feedback from the academic experts, the case study validation and the external verification, it can conclusively be said that the design requirements are met and that the model does indeed solve the research problem statement.

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